

## EMERGENCY CASEBOOK

## Seeing the invisible: painless aortic dissection in the emergency setting

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Acute dissection of the aorta can be one of the most dramatic cardiovascular emergencies. Classically, aortic dissection presents as sudden, severe chest, back, or abdominal pain that is characterised as ripping or tearing in nature. However, a timely diagnosis can be elusive in the event of an atypical presentation. In this report, the authors present two patients with painless aortic dissection who were misdiagnosed during their initial evaluation in the emergency department.

**A**ortic dissection may not always present with symptoms that suggest an acute cardiovascular event. Classical acute aortic dissection has been described as presenting with sudden, severe chest, back, or abdominal pain that is characterised as ripping or tearing in nature.<sup>1</sup>

However, several cases presenting with atypical features, often a variety of neurological or cardiac findings as well as the absence of pain, have been documented in recent years.<sup>2</sup> Establishing the diagnosis can be difficult when the classic pattern of pain is absent.

**Case 1**

A previously healthy 25 year old man was admitted to the emergency department (ED) with shortness of breath, pink sputum, cough, and fever. He also complained of paroxysmal nocturnal dyspnea, and orthopnea. He denied any pain in his chest, neck, back, or abdomen. He had no history of diabetes mellitus, hypertension, coronary artery disease, dyslipidaemia, or connective tissue disease and was not taking any medication.

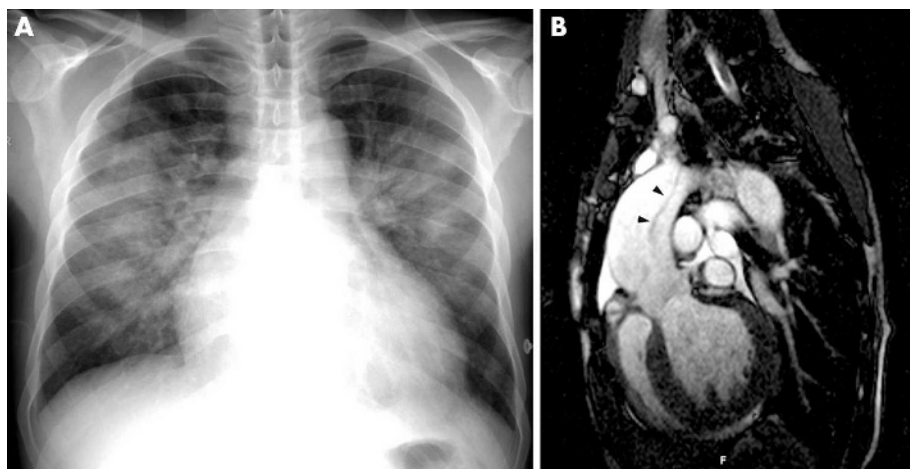
He was fully oriented but was diaphoretic and tachypneic. Vital signs were as follows: blood pressure 210/135 mm Hg;

pulse 126 beats/minute; respirations 40 breaths/minute; temperature 37.8°C. Oxygen saturation was 95% by pulse oximetry while on supplemental oxygen of 8 l/minute. Cardiovascular examination revealed a tachycardic regular rhythm and a mild diastolic murmur in the aortic area. Rales were heard in the lower and mid lung fields bilaterally. Pulses were present and equal in all four extremities. The remainder of the physical examination was unremarkable.

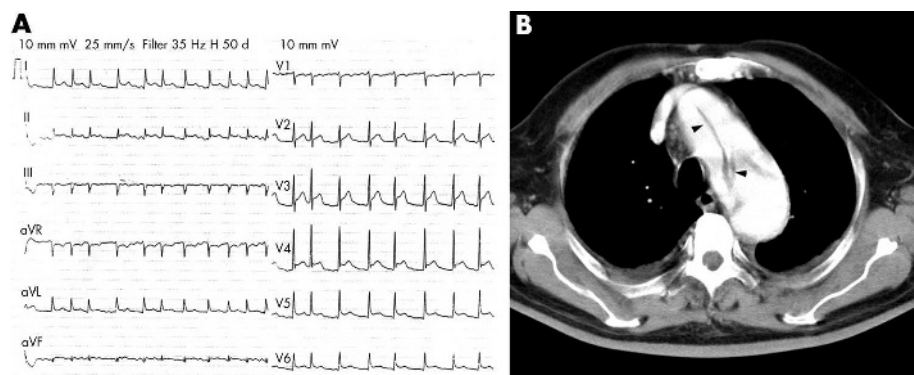
The electrocardiogram demonstrated sinus tachycardia, ST segment elevation in V1-V6 and negative T waves in V6 and aVL, as well as findings of left ventricular hypertrophy. Initial arterial blood gas results were: pH 7.53; pCO<sub>2</sub> 24.3 mm Hg; pO<sub>2</sub> 82 mm Hg; SaO<sub>2</sub> 97%. Electrolyte levels, renal function tests, transaminases, cardiac enzymes, and complete blood count were normal. The portable chest x ray revealed bilateral consolidation throughout the parahilar region (fig 1A) and the cardiothoracic ratio was increased.

The patient was treated with IV nitroglycerin, IV furose-mide, and oral aspirin for presumptive acute coronary syndrome with pulmonary oedema, and cardiology and pulmonary medicine consultations were obtained. Portable echocardiography revealed an ejection fraction of 43%, dilated hepatic veins, aortic regurgitation (1st–2nd degree) with a minimal pericardial effusion. The patient was admitted to the coronary care unit with the diagnosis of “myocarditis associated with pneumonia”. The following day, repeat echocardiography showed dilated hepatic veins, severe aortic regurgitation, and just 2.5 cm above the valve, a dissection flap as well as a dilated (5.5 cm) ascending aorta were seen. Colour doppler showed flow codes at the site of the intimal tear. Magnetic resonance (MR) angiography was then performed and revealed the aortic dissection beginning at the root of the ascending aorta (fig 1B).

The patient was operated upon by the thoracic surgeons and had an uneventful postoperative course.



**Figure 1** (A) Chest radiograph shows bilateral parahilar consolidation. (B) Sagittal MR angiography reveals an intimal flap (arrowheads) in the ascending aorta.



**Figure 2** (A) Electrocardiogram shows atrial fibrillation with a rapid ventricular rate and ST segment elevation in all leads except V1 and aVR. (B) CT scan obtained at the level of the aortic arch shows a flap (arrowheads) along the course of the whole aortic arch. Note also the bilateral pleural effusion.

## Case 2

A 86 year old man was admitted to the ED with complaints of increasing fatigue for 10 days, and dyspnoea and palpitations over the previous 3–4 days. He denied chest, neck, back, or abdominal pain. He smoked cigars for 40 years, denied any history of significant medical illness, and his only medication was aspirin 100 mg/day.

His blood pressure was 95/60 mm Hg in both arms with a heart rate of 108 beats/minute; respirations 16 breaths/minute; temperature 36.1°C. SaO<sub>2</sub> was 96% on room air. Cardiovascular examination revealed a tachycardic irregular rhythm and pericardial friction rub. There were occasional rales in the lower zones of both lungs. Blood electrolyte levels, renal function tests, hepatic transaminases, and cardiac markers were within normal range. White blood cell count was 11 900/mm<sup>3</sup>, haemoglobin was 12.7 g/dl, and platelet count was 383 000/mm<sup>3</sup>. Chest x ray was normal. Electrocardiogram showed atrial fibrillation with rapid ventricular rate and ST segment elevation in all leads except V1 and aVR (fig 2A).

Echocardiography performed in the ED found an ejection fraction of 40% and pericardial effusion of 4–5 mm; no local wall motion abnormalities were seen. The patient was admitted to the cardiology ward with the diagnosis “pericarditis”. Transoesophageal echocardiography was planned for further evaluation of atrial fibrillation. However, the patient insisted to be discharged from the hospital without further evaluation, taking only aspirin and medications for rate control of atrial fibrillation. After 10 days, the patient presented to the ED again with complaints of paresthesia and weakness in the right leg. In light of his history coupled with the current findings, thoracic computed tomography was performed, and it revealed a type-1 aortic dissection (fig 2B). After admission to the cardiovascular surgery intensive care unit, he was operated upon successfully, but died after a sudden cardiac arrest in the intensive care unit five days postoperatively.

## DISCUSSION

The incidence of aortic dissection ranges from five to 30 cases per million people per year.<sup>3</sup> Although the disease is uncommon, its outcome is frequently grave, and many patients with aortic dissection die before presentation to the hospital or before diagnosis.<sup>3</sup>

Aortic dissection is missed in up to 38% of patients on initial evaluation, and in up to 28% of patients the diagnosis is made at autopsy.<sup>2–4</sup> Traditionally, aortic dissection without pain was thought to be rare. More recent information suggests that symptoms in patients with aortic dissection are more variable than previously recognised, and the classic findings of sudden onset of tearing chest, back, or abdominal pain are often absent.<sup>1–2</sup> Other symptoms such as paraplegia,

acute peripheral ischaemia, and hemiplegia, if associated with such pain, are very meaningful. The “classic” pattern of pain is the presenting symptom in over 90% of patients, with fewer than 10% presenting with atypical symptoms.<sup>2</sup>

About 10% of aortic dissections are painless and may present with symptoms secondary to complications of the dissection.<sup>5</sup> One series of 235 patients reports that 33% of the patients denied pain or discomfort on presentation.<sup>6</sup> Painless aortic dissection should be considered in the differential diagnosis of the unexplained, non-traumatic, left sided haemorrhagic pleural effusion.<sup>3</sup>

Syncope and dyspnoea secondary to acute aortic valve regurgitation, facial swelling mimicking superior vena cava obstruction, coma, stroke, consumptive coagulopathy, gastrointestinal haemorrhage, and aorto-right atrial fistula may also be acute manifestations of aortic dissection.<sup>2–9</sup> A variety of neurological presentations, including an inability to walk, intermittent bilateral lower extremity paralysis, progressive motor and sensory deficits, unilateral lower extremity numbness, and hoarseness have also been reported.<sup>2–10</sup>

## CONCLUSION

Atypical presentations can render the diagnosis of aortic dissection particularly challenging for the emergency physician. A high index of suspicion is of vital importance in establishing a diagnosis of this catastrophic emergency which is associated with serious morbidity and mortality.

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